deprived of those privileges, the Adjutant-General at present being practically head of the Medical Department. Now that a former Secretary for War has directed public attention to the matter, it is to be hoped that those in authority will recognise that medical science is a vital part of military strength, a dictum which has for years been preached by the medical profession.

NOTES.

At the meeting of the council of the Royal Astronomical Society, held on Friday last, June 8, the following resolution was unanimously agreed to:—"That the council learn with deep concern of the danger threatened to the Royal Observatory, Greenwich, from the erection of a large electric generating station near the observatory; and desire to represent to the Admiralty at the earliest opportunity their conviction of the paramount importance of maintaining the integrity and efficiency of Greenwich Observatory, which has been adopted as the reference point for the whole world." It was further resolved that a copy of this resolution be forwarded to the First Lord of the Admiralty.

Mr. Haldane, M.P., Secretary of State for War, will open the electrical laboratory of the National Physical Laboratory on Monday, June 25, at 2.45 p.m.

At the twenty-fifth annual meeting of the Royal Society of Canada, recently held at Ottawa, Dr. William Saunders, the director of the Dominion Government's system of experimental farms, was elected president for the ensuing year, with Dr. S. E. Dawson vice-president.

Invitations have been issued by the Institution of Electrical Engineers for a conversazione at the Natural History Museum on Tuesday, June 26, to meet the visiting delegates from kindred institutions.

Prof. K. Birkeland, of Christiania, the inventor of the only successful commercial process for obtaining nitric acid by the direct oxidation of atmospheric nitrogen, will read a paper before the Faraday Society about June 26 entitled "Oxidation of Atmospheric Nitrogen by Means of the Electric Arc."

Much interest was aroused in India some time ago in the attempt to introduce the permanganate treatment of snake-bite. In the Central Provinces a large number of Sir Lauder Brunton's lancets were distributed last October for use by vaccinators and selected landholders. Several cases of successful treatment have been reported to Government, but unfortunately, says the *Pioneer Mail*, none of the reports gives sufficient detail to prove that the bites were really those of poisonous snakes, and it is therefore not possible to form any conclusions as to the value of the treatment.

A party of Birkbeck College zoological students spent Whitsuntide at West Mersea, near Colchester, collecting marine specimens. Owing to the low temperature of the surface waters the tow-netting expeditions were not very productive, but many and varied forms of life were brought up by the trawl and the dredge.

The annual conversazione of the Royal Geographical Society will be held at the Natural History Museum tomorrow evening, June 15.

A telegram from Reggio di Calabria states that fairly strong earthquake shocks were felt there on June 10 at 2.30 a.m. and 9.45 a.m. At Monteleone, Calabria, two strong shocks were felt at 2.45 a.m.

Prof. W. F. Kohlrausch, of Hanover, will be the president of the Verband deutscher Electrotechniker for 1906–8.

Dr. Bernhard Mohr, of London, recently presented to the museum of the German Chemical Society 100 letters written by the famous Liebig to Dr. Mohr's father, the late Prof. Friedrich Mohr, of Bonn, during the years 1834 to 1869.

Dr. Stutzer, assistant in the geological institute of the Freiburg (Saxony) Mining School, has been awarded a grant of 2000 marks by the committee of the Carnegie fund to enable him to continue his investigations on iron deposits in Lapland.

Prof. Ludwig Boltzmann, the well-known professor of theoretical physics in the University of Vienna, has been awarded the prize of the Peter Wilhelm Müller fund of Frankfurt a.M. The award consists of an appropriately worded gold medal and 9000 marks, and is made to the most brilliant workers in pure science.

At the seventy-eighth meeting of the Deutscher Naturforscher und Aerzte, which will be held this year on September 16–22 in Stuttgart, there will be an exhibition of scientific and medical appliances and subjects as in previous years. The König Karls Hall of the Königlicher Landesgewerbemuseum has been set apart for the purpose. All announcements and communications may be addressed to the president of the exhibition committee, Dr. Lampert, Archivstrasse 3, Stuttgart, from whom further particulars may be obtained.

Prof. Walter Nernst, professor of physical chemistry in Berlin, has declined the opportunity of proceeding to Leipzig as the successor of Prof. Ostwald, whose resignation will take place on September 30. Prof. Nernst was formerly a privatdocent at Leipzig from 1889 to 1891, when he accepted a professorship in Göttingen University. According to the *Physikalische Zeitschrift*, Prof. Ostwald's successor is to be Dr. K. Haussermann, professor of technological chemistry and director of the applied chemistry laboratory of the Technical High School, Stuttgart.

A special meeting was held in the Great Hall of the University of Athens on May 20 to celebrate the fortieth anniversary of Dr. A. C. Christomanos's appointment as professor of chemistry in the University. A large audience, including the Greek Minister of Education, the University professors and students, and many of the general public, was present. Dr. A. C. Dambergis, the professor of pharmaceutical chemistry, referring to the great work which Prof. Christomanos has done in the forty years, asserted that the greatest has been the pioneer work in the introduction of scientific chemistry into Greece with the provision for laboratory work in chemistry and the other sciences, and more particularly in organising so successfully the large chemical department of the University with its laboratory accommodation for 130 students. Prof. Christomanos was the recipient of numerous honours, including several from foreign countries.

Dr. Rudolf Knietsch, the director of the Badische Anilin- und Soda-Fabrik, died on May 28 at the early age of fifty-two. From the *éloge* dedicated to Dr. Knietsch's memory by the Badische Anilin- und Soda-Fabrik, we learn that Dr. Knietsch was born in 1854 in Oppeln, in Schlesien. From 1876–1880 he studied at the Technical High School in Berlin, and graduated in 1881 at Jena University. He was for a short time an assistant in Dr. Emil Jacobsen's private laboratory, and in 1882 entered the Farbenfabrik von Bindschedler und Busch in Basle, where he worked at the nitration of dichlorobenzaldehyde and the preparation of chloroindigo. In 1884 he joined the Anilin- und Soda-Fabrik. He founded in 1888 the industry of liquid chlorine, and devoted himself with zeal to the task of modifying the Winkler process of preparing sulphuric anhydride. Knietsch read an important communication on the results of this work before the German Chemical Society in 1901. For the solution of the problem of the commercial preparation of synthetic indigo Dr. Knietsch proved himself to be the right man in the right place. In company with a number of earnest colleagues he worked out and developed the present manufacturing processes for the preparation of the materials necessary for the synthesis of indigo and other dyes. Always broad-minded, he was ready at any time to replace existing plant and methods by improvements. In 1904 Knietsch was placed at the head of the firm. The Verein deutscher Chemiker, at the annual general meeting in Mannheim in 1904, awarded the Liebig gold medal to Dr. Knietsch, and at the opening of the new Technological Mechanical Institute of the Dresden Technical High School in 1905 the honorary degree of Dr. Ing. was conferred on him.

THE weekly weather report issued by the Meteorological Office for the period ending June 9 shows that the present month has opened with typical summer weather. The major portion of the United Kingdom was entirely rainless, the only rains reported occurring in parts of Scotland and Ireland, and amounting only to few hundredths of an inch. Bright sunshine was for the most part greatly in excess of the average, 80 per cent. of the possible duration occurring in the Channel Islands and 71 per cent. in the south of England. The temperature averages were generally rather low, and in the south of England the sheltered thermometer at night fell below the freezing point.

WE learn from the Journal of the Society of Arts that what can be done by sanitation to stamp out malaria is shown by Mr. Consul Morgan in his reference (No. 3565, Annual Series) to the work of the Italian Red Cross Society during late years to stamp out malaria in the Roman Campagna. The first attempt was made in 1900, when the returns showed that not less than 31 per cent. of the inhabitants of the "Agro Romano" had been fever-stricken. In 1901 the figure was returned at 26 per cent., 20 per cent. in 1902, 11 per cent. in 1903, 10 per cent. in 1904, and 5·1 per cent. during last year. These results were obtained by strict sanitary measures, use of wire nets so as to prevent access of mosquitoes to cottages, and free distribution of quinine among the peasantry.

THE annual dinner of the London section of the Society of Dyers and Colourists was held on May 23, when a representative company was presided over by Sir Thomas Wardle, president of the society. In proposing the toast of the London section of the society, the president expressed his astonishment at the beautiful work being done in the dyeing industry in Italy, and how much pure chemistry is being made use of in that work. London, he continued, is taking an interest in chemical development, and he suggested that the Dyers' Company might associate itself in some way with such a body as the Society of Dyers. Sir Thomas Wardle concluded his address by appealing to the younger men to take advantage of the splendid scientific training now available, and to induce others to do the same, for by such methods many of our lost industries would be won back. Responding to the toast of the "Allied Industries," Dr. J. C. Cain said no doubt to some extent our patent laws, the lack of cheap alcohol, and other causes have had a certain amount of influence in the downfall of the English aniline dye industry, but in his opinion the only real cause has been the lack of a man of commanding genius, like Perkin or Nicholson, who could discover a colour, make it, and sell it. Prof. R. Meldola, F.R.S., in proposing "The Visitors," remarked that we have lost tone in our supremacy in this branch of manufacture, but the blame is not on the shoulders of the dyers, who have always been on the *qui vive* to utilise new discoveries. It was the English and Scotch dyers who first took up chemical dyes and encouraged the manufacturers to proceed. Mr. F. Robinson proposed "The Chairman," and directed attention to the fact that present-day results and modern methods could never have been attained but for the research chemists and their work. At one time dyeing was more an art than a science; now our chemists have made it practically a science. The old dyestuffs such as indigo and madder are gradually and surely disappearing, and are being supplanted by synthetic products. The English dyeing and colouring industry is moving with the times, and will eventually hold its own against all rivals.

WE have received a copy of No. 12 of the fifteenth volume of the *Zeitschrift für Oologie und Ornithologie*, said to be the only serial in the world specially devoted to the interest of the egg-collector. The present part contains notes on the eggs of two African birds previously unknown to collectors, general observations and suggestions on subjects intimately connected with oology, and descriptions of certain eggs from Turkestan.

IN the report for the year 1905, the committee of the Albany Museum, while referring with satisfaction to the general progress of that institution and the present state of the collections, directs attention to the congested state of the buildings, and the urgent need for more space and for additional funds, if the work is to be carried on in an effective manner. The appointments of Profs. Duerden and Schwarz to the zoological section are stated to have been followed by most satisfactory results.

IT has been stated by those who have investigated the subject in the selachian group that fishes lack lymphatic vessels other than those of the visceral system, the superficial and deep-seated vessels of the heart and trunk being regarded as veins, and their sinuses as venous sinuses. However this may be in the case of sharks, Mr. W. F. Allen, in a paper on the lymphatics of the loricate fish Scorpænichthys, published in the Proceedings of the Washington Academy (vol. viii., pp. 41–90), shows that it is not so in the case of the group to which the latter belongs. On the contrary, Scorpænichthys has as fully developed a lymphatic system as any vertebrate, so that it may be said that in general wherever connective tissue exists there lymphatics will be found.

THE February and March issues of the Proceedings of the Philadelphia Academy contain a paper by Mr. J. A. G. Rehn on tropical American grasshoppers of the group Acridinæ, with descriptions of several new forms, and likewise the commencement of one by Dr. R. Smith on the phylogeny of the races of a species of gastropod of the Eocene genus Volutilithes. In the case of the genus Fulgar, it has been supposed that certain Miocene forms represented the ancestral stock of the living American species. According to the author this is not so, the fossil forms being decadent senile offshoots from the original line, which appear, however, to be dominant. A very similar state of affairs is shown to exist in the case of Volutilithes, with the important exception that the main ancestral line is the one which is dominant.

THE Ostracoda of the San Diego region (No. 1), the California shore-anemone, *Bunodactis xanthogramma*, and sexual dimorphism in the hydroid polyps of the genus Aglaophenia, form the subjects of articles nine, ten, and eleven of Contributions from the San Diego Marine Laboratory issued in vol. iii. of the Zoological Publications of the University of California. In the article on dimorphism (by Mr. H. B. Torrey and Miss Martin) it is shown that in the genus mentioned, not only are the gonophores dimorphic, but an analogous dissimilarity also obtains in the jointed plumose structures known as corbulæ, of which numerous examples are figured. The plate intended to illustrate Mr. Torrey's paper on the sea-anemone was destroyed in the San Francisco fire, but a new one will be supplied later.

THE April issue of *Spolia Zeylanica* is of more than usual interest. It opens with a translation of an article by Dr. F. Doflein, of Munich, entitled "Termite Truffles," being the description of certain remarkably nodular masses of fungus cultivated in their nests by white ants in Ceylon. The hillocks of these termites were found by the author to contain a number of large chambers, each approximately the size of a cocoanut, and each containing one or more large friable masses, looking somewhat like small bath-sponges. These cakes were occupied by thousands of termites, ensconced in the cells and connecting passages. The framework of each was beset with numerous white nodules of the size of pins' heads, which proved to be fungus-growths. These nodules are eaten by the larvæ of the workers and soldiers and by the sexual forms at all ages, the adult soldiers and workers having, however, other food. That the funguses are introduced and cultivated by the termites seems undoubted. In the same publication Dr. A. Willey records a singular instance of symbiosis in a crab, originally described from Mauritius under the name of *Melia tessellata.* When first described its habit of holding sea-anemones in its two front claws was not noticed, but although this was observed later on in Mauritius, it has been generally overlooked. According to Dr. Willey's account and figure, the crab holds in each claw a small white anemone, which it presents, with the tentacles fully expanded, to every intruder, in "true boxing attitude." The ground-colour of the crab is whitish with a rosy flush on the front of the shell, which has also a pattern of black lines. "Probably both crab and actinians benefit by the association, the actinians enjoying increased mobility, and the crab sheltering and defending itself with the living gloves with which it is provided." In the author's opinion, the stinging threads of the anemone are the active means of defence and offence.

A LEAFLET, No. 16, published by the Department of Agriculture in British East Africa, contains the reports on various samples of cotton grown at Golbanti and Malindi. The cotton was produced from Egyptian Afifi seed, except for one sample of Sea Island and one of American upland. The soils on which the crops were grown were a heavy alluvium or a lighter red soil, the latter yielding much better results, owing probably to its requiring less cultivation. The values, except for the Sea Island, ranged between fivepence and sixpence per pound. There is a striking difference between the yield from Egyptian seed on the red soil and the other crops obtained.

THE green colour of plants is such an ever-present reality that the explanation is apt to be overlooked. The absorption spectra of chlorophyll and the curves of absorption and assimilation do not directly furnish a solution, and it is only from the consideration of these, together with the effects produced by the absorption and dispersion of light rays in the atmosphere, that a satisfactory explanation is obtained. The subject is ably discussed by Prof. E. Stahl in *Naturwissenschaftliche Wochenschrift* for May 6, where he points out that the two pigments contained in chlorophyll are suited to the sun's rays as modified by reflection, the colours being complementary to those of the chlorophyll-absorbing rays that predominate in diffused light, and that certain rays, *e.g.* the ultra-red, are excluded wholly or in part owing to the danger of too great absorption in direct sunlight.

THE fungus *Phycomyces nitens* is well adapted to physiological investigation owing to the rapidity of its growth and its sensibility to stimuli. Proceeding out of investigations by Elfving wherein curvature of the sporangiophores was attributed to physiological action through space, Prof. L. Errera was led to experiment on the curvatures caused by the presence of various substances such as rough and polished metals, porcelain, glass, deliquescent salts, marble, mica, &c. The results so obtained, and the notes relative to them, had been sufficiently fully drafted before Prof. Errera's death to allow of publication, and they appear in *Recueil de l'Institut botanique*, Brussels, vol. vi., 1905. It was found that Phycomyces curves towards bodies that absorb moisture and away from those that give off vapour. Thus the sporophores curve towards an unpolished rod of iron, but not towards a piece that is perfectly polished. A number of photographs accompany the paper, of which one of the most striking is reproduced. A dry, porous pot is suspended over the Phycomyces growing on bread in a moist atmosphere. The pot absorbs moisture, and the sporophores have curved right over the surface of the pot, some of them ultimately turning upwards owing to the stimulus of gravity.

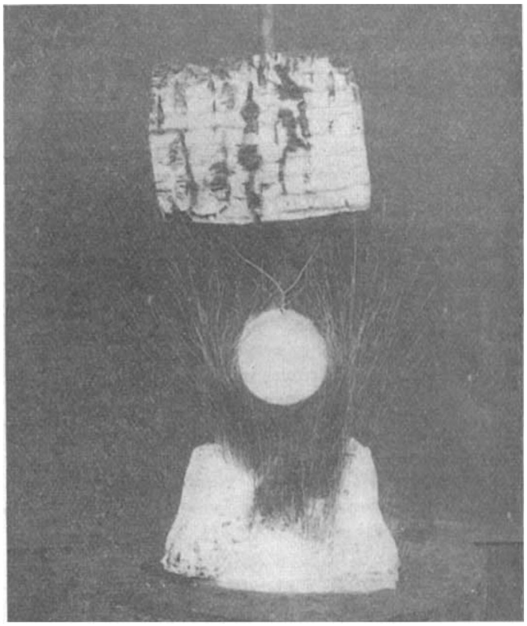
FIG. 1.—*Phycomyces nitens* stimulated to grow towards and over the surface of a porous pot.

THE report for 1905 of the Botanical Exchange Club of the British Isles, prepared by Mr. J. W. White, has been received. Besides being the official organ for the publication of notes by the collectors or special authorities on the correct determination of the plants, the report provides a record of new or rare species with the localities in which they have been found. The new records include *Caltha radicans* for Perthshire, *Ulex Gallii*, var. *humilis*, for Cornwall, the aliens *Hibiscus Trionum* and *Bromus unolioides* collected in Salop, *Lotus tenuis* from near Cardiff, and *Epipactis atrorubens* from Banff. The specific determination of the large-flowered Œnothera so plentiful on the Lancashire coast having been questioned, Mr. C. Bailey sent specimens to Dr. O. Focke, of Bremen, who considers that it is probably a form of the famous variable *Œnothera Lamarckiana*.

THE Home Office has issued for 1905 statistics of the persons employed, output, and accidents at mines and quarries in the United Kingdom, arranged according to the inspection districts. The total number of persons employed was 887,524, of whom 858,373 worked at the 3252 mines under the Coal Mines Act and 29,151 at the 688 mines under the Metalliferous Mines Act. At the quarries under the Quarries Act there were 94,819 persons employed. The death-rate from accidents was 1·49 per 1000 persons employed for coal miners and 2·49 per 1000 for metal miners.

WE have received the two latest additions to the valuable series of bulletins issued by the Peruvian Corps of Mining Engineers. In *Boletin* No. 30 Mr. Carlos E. Velarde gives a detailed account of the means adopted to obviate accidents in the mines of the Cerro de Pasco. *Boletin* No. 31 is a monograph on the mineral resources of the province of Cajamarca, by Mr. F. Malaga Santolalla. The work covers eighty-three pages, and is well illustrated and furnished with maps and sections. The coalfields of the province are of considerable importance, bituminous coal being worked at Yanacancha and anthracite at Punre. Descriptions are also given of mines of silver-lead ores, of copper, antimony, and sulphur. In fact, the province is one of exceptional mineral wealth.

MESSRS. SWAN SONNENSCHEIN AND CO., LTD., have published a second edition of Mr. C. H. Hinton's book on the fourth dimension. The first edition was reviewed in the issue of NATURE for July 21, 1904 (vol. lxx., p. 269), and it is only necessary to say that the new edition differs chiefly by the addition of a new chapter of twenty-three pages on a language of space. The new chapter is also published separately.

OUR ASTRONOMICAL COLUMN.

PHOTOGRAPHING THE CORONA WITHOUT A TOTAL ECLIPSE.—A communication from MM. Millochau and Stefanik referring to a recent note in these columns (May 31, p. 112) on their proposed method of photographing the corona without a total eclipse of the sun points out that the meaning of part of their note in the *Comptes rendus* was misinterpreted.

The successful experiments at Meudon dealt with the feasibility of photographing the line at λ 5303 with a *spectrograph*; and others, performed since their communication to the academy was published, have clearly affirmed the possibility of observing the green coronal line when the atmosphere is sufficiently pure and suitable screens are employed. It is this study of the *spectrum* of the corona that they hope to complete on the summit of Mont Blanc.

OBSERVATIONS OF NOVA GEMINORUM.—The results of some interesting observations of Nova Geminorum, which were made by Prof. Barnard between the date of the Nova's discovery (March, 1903) and February 27, 1906, appear in No. 6, vol. lxvi., of the Monthly Notices (R.A.S.).

At the time of discovery the magnitude of the Nova was 8·0, but it steadily decreased until at the present time the object is but very little brighter than the fifteenth-magnitude star which slightly precedes it.

The observations made in order to discover any possible difference of focus between the Nova and the surrounding stars indicated no such difference at first, but on September 21, 1903, it was found that the focus for the Nova was 0·29 inch further from the object-glass than that of a tenth-magnitude preceding white star. In connection with these observations a curious feature was noted on March 30, 1903. The Nova appeared to have two distinct foci, both of which gave sharp images. The one image was of about 8·5 magnitude, of reddish-yellow colour, and at the ordinary stellar focus, whilst the second was of the tenth magnitude, about 0·39 inch further out, and of a beautiful crimson colour. On April 6 the crimson image was still present, though not so strong or definite, and on April 27 it had entirely disappeared. This image was probably due to the strong Hα line in the spectrum of the Nova.

Measures of the distances between the Nova and the surrounding comparison stars, of which Prof. Barnard gives a chart, indicate a decrease of distance between one of the latter and the Nova. From this it would appear that the Nova is in motion, but that cannot be stated as a fact until further measures have been made. The measures of the position of the Nova gave no indication of a parallax.

PERSONAL EQUATION IN PHOTOMETRIC OBSERVATIONS.—In No. 4089 of the *Astronomische Nachrichten* Prof. Ceraski directs attention to the fact that in recording the results of observations made with the Zöllner photometer it very often happens that no mention is made of the relative positions of the real and the artificial stars during the observation, and asks that this should always be carefully recorded by the observer.

There is often an effective personal equation introduced into the results, depending upon whether the real star is to the right or to the left of the artificial star when the observation is made, and as this equation varies with the instrument employed and the magnitude of the variable star at the moment of observation, it becomes important that the conditions should be carefully recorded and the resulting corrections applied when the final values are computed.

COMET 1906*b* (KOPFF).—In No. 4087 of the *Astronomische Nachrichten* Herr M. Ebell publishes a newly derived set of elements and an ephemeris for comet 1906*b*. The following are the elements:—

$$T = 1905 \text{ Oct. } 18 \cdot 6620 \text{ (Berlin M.T.)}$$

$$\left.\begin{array}{l} \infty = 158^\circ\ 42'\ 11''\cdot 4 \\ \text{☊} = 342^\circ\ 13'\ 35''\cdot 1 \\ i = 4^\circ\ 14'\ 32''\cdot 4 \end{array}\right\} 1906\cdot 0$$

$$\log q = 0\cdot 522130$$

The ephemeris shows that the comet has just passed from the constellation Leo, wherein it was discovered on March 13, into Virgo, and is situated about one-third of the distance between υ Leonis and β Virginis, reckoning from the former.

A note in the *Observatory* (No. 371) points out that the perihelion distance of this comet is greater than any previously recorded, with the exception of that of the comet of 1729. Prof. Wolf has found an image of the comet on a plate secured on January 14, 1905, more than a year before the discovery, an event which is unique in the history of cometary observations. At that time the magnitude of the object was about 0·4 that at the time of discovery, and approximately equal to the present magnitude.

OBSERVATIONS OF VARIABLE STARS.—Twenty-two newly discovered variable stars in Carina are announced in Circular No. 115 of the Harvard College Observatory. The variability of these stars was discovered by Miss Leavitt from the examination of six plates taken with the Bruce telescope, the total number of variables discovered from these plates being now thirty-nine. The star H 1232 is found to